November 1977 ESO 441

THE OHIO STATE UNIVERSITY
FARM BUSINESS MANAGEMENT

COMPUTERIZED PLANNING FOR DAIRY FARMS

INVESTMENT ANALYSIS AND CASH FLOW PROJECTION
MORE COWS
NEW BUILDINGS
NEW EQUIPMENT
MORE LAND

INSTRUCTIONS AND EXAMPLES

Prepared by: Allan E. Lines -- Extension Economist
Donald E. Pritchard -- Extension Dairyman

YOUR NAME _____

YOUR ADDRESS _____
(Road and Number)

_____
(city, town, or village)

_____ _____
(county) (state) (zip code)

YOUR TELEPHONE NUMBER _____ - _____ - _____

Department of Agricultural Economics and Rural Sociology
The Ohio State University
Columbus, Ohio

TABLE OF CONTENTS

Ohio users should see page 57 for instructions on use of the program in states for which no state tax subroutine is available. No state tax subroutine is available for Ohio.

COMPUTERIZED PLANNING FOR DAIRY FARMS[1/]
ACCESS PROGRAM 50 FORM 0

INTRODUCTION

Modern dairy businesses frequently require major change, often involving large capital investment, if they are to be kept competitive. The managers of these businesses must be continually searching out and analyzing alternatives to determine which changes may be profitable and when needed changes should be made. Many of the investments that should be analyzed have characteristics that make appropriate analysis difficult. These include:

1. A multiperiod life with expenses and income unevenly distributed throughout the life

2. A number of different individual investment items (machines, buildings, land parcels and groups of animals) with different asset lives and tax status

3. A large enough potential effect on income to move the business owners through several marginal tax rates

4. Differential susceptibility to the impact of inflation.

The major capital investment computer program discussed in this publication is designed to assist with the analysis of investments having some or all of these characteristics. In general, the model calculates the income and expense flows that could be expected to be generated by an investment, converts these flows to an after-tax basis and discounts the after-tax flows to determine the expected gain or loss (net present value) that would result if the investment were made. Input for the model includes the characteristics of the individual investment items, the cash flows to be generated by the investment, tax status and the opportunity cost of capital. Output includes the net present value of the investment and a summary of the flows generated by the investment.

An optional dairy budget generator is part of the model. The generator may be used to generate cash flows for dairy situations for which base year information is available. It cannot be used for non-dairy alternatives nor for cases where data for a base year of dairy farm operations is unavailable.

1/ An Ohio adaptation of "Major Capital Investment Computer Program" by E. L. LaDue and G. L. Casler, Department of Agricultural Economics, Cornell University.

This publication is designed to assist a user of the major capital investment computer program in making appropriate input entries and interpreting the results. The first section of the publication explains appropriate input entries, indicates possible error messages and explains the results. Table 1, indicating the values assumed by the model, is placed at the front of the publication for easy access. Use of this table is explained under modification of assumptions. The second section contains an example of the use of the program. A general input form and example output from a printing terminal, and a short form with touch-tone output are included. The same problem is used for all examples. This example is for a dairy farm expansion and uses the budget generator.

INSTRUCTIONS FOR PREPARING DATA

To prepare data for input to the computer, the data relevant to the problem being analyzed are entered on an input form. Two forms are available; A General Input Form and a Short Input Form. The General Input Form contains identification of input items and space for one adjusted analysis (an example appears on page 35). The Short Input Form identifies input data only by line number but provides space for three adjusted analyses (an example appears on page 51). The General Input Form should be used as a guide when using the Short Input Form.

When entering data on the input form, the number of digits and placing of the decimal must conform with the spacing indicated on the input form. The number of digits (numbers) cannot exceed the number of spaces available. Decimal points cannot be added or moved. Fractions must be entered in decimal form. If negative numbers are to be entered the minus sign (-) must be entered and it uses one of the available spaces.

Table 1. VALUES ASSUMED BY THE MODEL FOR OHIO USERS

Assumed value	Assumption Code	Definition
General Model Assumptions:		
50.0	56	Percent that the price of yearlings purchased is of cow purchase price.
100.0	57	Percent of added yearlings that will be purchased (whenever cows are purchased, sufficient yearlings will be added to provide replacements required in the year after purchase).
90.0	58	Percent that price of raised animals is of the price of purchased animals.
12.0	01	Cull calf price as a % of cull cow price.
40.0	02	Calves sold as % of cow numbers.
0.0	03	Unincorporated business tax rate (percent).
10.0	04	Federal investment tax credit rate (percent).
0.0	05	State investment tax credit rate (percent) (will be doubled if unincorporated business tax is paid).
99.0	54	Rate (percent) by which investment items are inflated. 0-98 = Purchased buildings, equipment, land, purchased cattle and cull cattle inflated at rate entered. 99 = These investment items are inflated by the rates indicated in assumptions 6 through 10.
7.0*	06	Inflation rate on buildings.
7.0*	07	Inflation rate on equipment.
0.0*	08	Inflation rate on purchased cattle.
6.0*	09	Inflation rate on purchased land.
0.0*	10	Inflation rate on cull cattle.

*These values are used only if assumption 54 is set to 99. However, if these assumptions are changed under "modification of assumptions," the rate entered will be used even if assumption 54 is set at zero.

Table 1 contd. VALUES ASSUMED BY THE MODEL

Assumed value	Assumption code	Definition
Dairy Budget Generator Assumptions:		
1.0	55	Year for which budget data are to be printed out (for touch-tone terminals).
0.0	11	If 0.0, labor cost will increase to value entered on line 47 with the annual increase proportional to the increase in herd size.
		If 1-5, total increase from base year cost to value entered on line 47 occurs in year 1, 2, 3, 4, or 5, i.e., 1 indicates increase occurs in year 1.
$100.0	53	Minimum level of purchased feed per cow (crop sales cannot be used to offset this protion of feed bill).
$200.0	12	Cost of feed value provided by an acre of corn (100 bu. at $2).
$225.0	13	Cost of feed value provided by an acre of hay crop (4.5t. at $50).
$ 90.0	14	Cost of feed value provided by an acre of other feed crops. (60 bu. oats at $1.50).
0.0	15	If value is 0.0, feed-crop sales will be used to offset additional feed purchases required when acres per cow declines. If value is 1.0, feed costs will be increased by the value of the additional feed purchases required and feed-crop sales will not be reduced.
$ 25.0	16	Minimum increase in machine repair cost per cow with increases in herd size.
100.0	17	Maximum percent increase in auto expense.
70.0	18	Fertilizer and lime costs on hay as a percent of corn.
45.0	19	Fertilizer and lime costs on other feed crops as a percent of corn.
40.0	20	Fertilizer and lime costs on non-feed crops as a percent of corn.
70.0	21	Seeds and plants cost on hay as a percent of corn.

Table 1 contd. VALUES ASSUMED BY THE MODEL

Assumed value	Assumption code	Definition
60.0	22	Seeds and plants cost on other feed crops as a percent of corn.
100.0	23	Seeds and plants cost on non-feed crops as a percent of corn.
80.0	24	Spray and other costs on hay as a percent of corn.
25.0	25	Spray and other costs on other feed crops as a percent of corn.
60.0	26	Spray and other costs on non-feed crops as a percent of corn.
1.0	27	Percent decline in milk production per 10 percent increase in herd size over 20 percent (enter negative value if production is to increase).
3.0	28	Years to recover from decline in milk production due to expansion (maximum of 5 years, enter 9 if recovery not expected to occur).
99.0	29	Indicates rate by which dairy budget cash flows are to be inflated. 0-98 = All items listed in assumptions 59-81 will be inflated by the rate entered. 99 = Inflation coefficients indicated in assumptions 59-81 will be used.
	30-52	Can be used to specify any particular item in the generated budget. The value entered will be used for all years.

Code	Item	Code	Item	Code	Item
30	Labor	38	Vet and medicine	46	Rent
31	Feed	39	Other dairy expense	47	Telephone & Electric
32	Machine hire	40	Lime & fertilizer	48	Misc. expenses
33	Machinery repairs	41	Seeds and plants	49	Milk sales
34	Auto expense	42	Spray and other crop expenses	50	Livestock sales
35	Gas and oil	43	Land, bldg., & fence repair	51	Crop sales
36	Purchased livestock	44	Taxes	52	Misc. receipts
37	Breeding fees	45	Insurance		

Table 1 contd. VALUES ASSUMED BY THE MODEL

Assumed value	Assumption Code	Definition
	59-81	Used to specify the rate of inflation (percent) for all items in the cash flow budget. The values listed will be used only if assumption code 29 is set at 99. If assumption code 29 is set at 99, the values listed will be used for all items except those specifically set at other rates by additional entries under input Section IX, "Modification of Assumptions".
0.0	59	Land rental rate
6.0	60	Labor
6.0	61	Feed
6.0	62	Machine hire
7.0	63	Machinery repairs
7.0	64	Auto expense
10.0	65	Gas and oil
0.0	66	Purchased livestock
6.0	67	Breeding fees
6.0	68	Vet and medicine
6.0	69	Other livestock expense
3.0	70	Lime and fertilizer
6.0	71	Seeds and plants
3.0	72	Spray and other crop expense
7.0	73	Land, building, and fence repair
6.0	74	Taxes
6.0	75	Insurance
0.0	76	Rent (base year)
10.0	77	Telephone and electricity
3.0	79	Milk sales
0.0	80	Livestock sales
0.0	81	Crop sales

EXPLANATION OF INPUT DATA

At the top of the input form, space is provided to enter the PROGRAM number, NAME of the person for whom the analysis is being made, and an INVESTMENT description. For mail-in, batch processing or use on the Virginia Polytechnical Institute (VPI) Computerized Management Network (CMN) System, the program number consists of two parts. The first three digits are the number of the program, 050. The last two digits indicate which input form is being used. Thus, if form 1 is being used, the appropriate entry would appear as

PROGRAM 0 5 0 0 1

For touch-tone and University of Michigan (U of M) printing terminal use only four digits are used. The first 2 indicate the program number (50), the third indicates the form number (1) and the last indicates the data file being used (1 to 4). Twenty-four characters may be used for the name and 40 for the investment description. Each letter, number, period, dash and space count as a character. In identifying the investment item it is suggested that you be as descriptive as possible about the particular investment being considered and for the problem being analyzed.

Section I. Planning Period

1a. Enter the number of years to be used in evaluating the investment. The maximum planning period length is 25 years. Fractions of years cannot be entered.

Section II. Building Investment Information

All information on buildings or other depreciable real estate, such as orchard trees or vineyard plantings, should be entered in this section. Space is provided for three sets of buildings and/or depreciable real estate. If more than three buildings or plantings are included in the investment, they should be reduced to three groups by combining items with similar characteristics, i.e., similar life, salvage value, and depreciation method. In the discussion below, and on the input form, the word buildings is used to denote buildings and/or other depreciable real estate. The line to the right of Item or Group is used only for user identification. It is not entered into the computer.

2a. Enter the total cost of the building or buildings in group A.

2b. Enter the year the buildings in group A are to be purchased. If they are purchased at the beginning of the planning period, enter zero; if they are purchased one year from the beginning of the planning period (or at the beginning of the second year), enter 1. In general, enter the number of years from the beginning of the planning period until the building is purchased.

3a. Enter the number of years over which the item is to be depreciated. This must be equal to or less than the number of years to replacement indicated in 3f. below. If the item is not depreciable, enter "00".

3b. Enter the salvage percentage to be used. Salvage percent should reflect the estimated market value of the investment at the end of its period of use. This percentage should be entered even for non-depreciable items since the value used for terminal value of non-depreciable items is the salvage value. The salvage value entered is used for depreciation purposes and as an estimate of true market value at the end of the investment's life.

3c. Indicate the depreciation method to be used for this investment group. Remember that certain "fast" depreciation methods are ineligible for use on buildings.

3d. If the investment qualifies for Federal investment tax credit, enter "1"; if it does not, enter "0".

3e. If the investment qualifies for State investment tax credit, enter "1"; if it does not, enter "0".

3f. If the building is to be replaced, enter the number of years it is to be used before replacement. Buildings with a life shorter than the planning period will be replaced the number of times required to complete the planning period. Any building that is not completely used up by the end of the planning period will be given a terminal value equal to its undepreciated value. If a building is not to be replaced, enter "00". If a building is not to be replaced, the model will assume that the item will either physically last for the entire planning period or that the item is no longer required after it wears out. Care should be exercised in coordinating the planning period length selected in line 1a. with the length of life appropriate for the buildings constructed.

4a. - 5f. These lines correspond exactly with lines 2a. - 3f. except that they apply to building item or group B.

6a. - 7f. These lines correspond exactly with lines 2a. - 3f. except that they apply to building item or group C.

Section III. Equipment Investment Information

All machinery and equipment investment information should be entered in this section. Space is provided for three sets of equipment. If more than three equipment items are included in the investment, they should be reduced to three groups by combining items with similar characteristics, i.e., similar life, depreciation type, investment credit status.

8a. Enter the total cost of equipment item or group A. This should include transportation, installation or other costs where applicable. If items are to be traded in, the fair market value of the trade-in should be added to the boot price to get the actual cost. Include only equipment items which are part of the investment. Do not include items that will be purchased whether the investment is made or not.

8b. Enter the year that equipment item or group A is purchased. If it is purchased at the beginning of the planning period, enter zero. If it is purchased in later periods, enter the number of years from the beginning of the planning period until the item is purchased.

9a. Enter the number of years over which the item is to be depreciated. This must be equal to or less than the number of years to replacement indicated in 9f. below. If the item is non-depreciable, enter "00".

9b. Enter the salvage percentage to be used. Salvage percent should reflect the estimated market value of the investment at the end of its period of use. The salvage value indicated is used for tax purposes and as an indicator of true market value at the end of the investment's life.

9c. Indicate the depreciation method to be used for this investment group. Remember that used machinery does not qualify for certain "fast" depreciation methods.

9d. If the equipment item or group qualifies for Federal investment tax credit, enter "1"; if it does not enter "0".

9e. If the equipment item or group qualifies for State investment tax credit, enter "1"; if it does not, enter "0".

9f. If the equipment item or group is to be replaced, enter the number of years it is to be used before replacement. Equipment with a life shorter than the planning period will be replaced the number of times required to complete the planning period. Any equipment item with one or more years of useful life at the end of the planning period will be given a terminal value equal to its undepreciated value.

If the equipment item is not to be replaced, enter "0". If an equipment item is not replaced the computer program will assume that the item will either physically last for the entire planning period or that the item is no longer required after it wears out.

10a. - 11f. These lines correspond exactly with lines 8a. - 9f. except that they apply to equipment item or group B.

12a. - 13f. These lines correspond exactly with lines 8a. - 9f. except that they apply to equipment item or group C.

Section IV. Livestock Investment Information

The model is designed to handle livestock investments at any time during the first five years of the planning period. It is assumed that all changes in livestock numbers that relate to the investment will be accomplished during the first five years. Only breeding (and/or milking) livestock should be entered in this section. Purchase and sale of feeder steers or similar livestock should be included in cash flow budgets.

Raised livestock used to increase herd size are included as part of the investment. If the investment were not made, these animals could be sold. The model calculates the number of raised livestock to include in the investment as that part of the year-to-year increase in herd size not provided by purchased animals. For example, if (1) the number of cows before investment is 100, (2) the average number of cows in year 1 is 125 and (3) the number of animals purchased in year 0 (at the time of the investment) is 15, the model will assume that 10 raised animals are part of the investment. The cost of raised cattle is indicated by the price entered for purchased livestock and assumption 58.

Whenever the herd size is increased, using either purchased or raised animals, the model assumes that sufficient yearlings must also be added to provide the raised replacements required in the following year. It takes at least two years to grow a replacement and only one year will lapse between the time the cows are added to the herd and the time the first of the added cows will be culled. Thus, either (1) the farmer will have to have excess yearlings at the time the investment is made, (2) additional replacements will need to be purchased the year following the herd size increase or (3) the farmer will have to buy additional yearlings at the time herd size is increased. In any of these cases, the cost of the additional yearlings should be charged as part of the investment. If replacements are raised, the cost of raising the yearlings to freshening age will be included in the cash flow as part of the expenses. Yearlings will <u>not</u> be purchased for that portion of the increase in herd size that is to be replaced with purchased animals, as indicated in input line 18c.

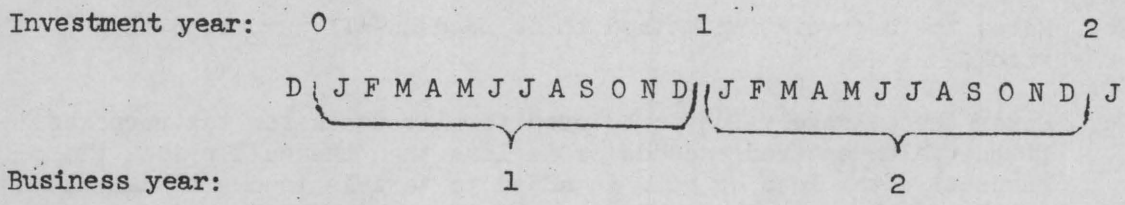
14a. Enter the number of cows at the time the investment is made. If additional cows have been (will be) kept (instead of sold) in anticipation of making the investment, these animals should be excluded from line 14a. If no animals are involved in the business, before or as part of the investment, enter zero on lines 14 <u>and</u> 15.

14b. Enter the average number of cows for the first year (first 12 months). This includes animals in the herd before the investment as well as those that are part of the investment. Only those animals that are bought in year zero will contribute to any increase in herd size for year 1.

14c. - 15c. Enter the average number of cows for the 12-month period implied by the year indicated.

16a. Enter the number of mature animals (cows or bred heifers) to be purchased at the beginning of the planning period. If younger heifers or calves are purchased with the expectation that they will be raised and will enter the herd in one or two years, these animals should either (1) be entered as purchases in the year they enter the herd, or (2) be included as raised animals by allowing the model to impute their investment cost in the year they will enter the herd.

16b. - 17b. Enter the number of mature animals to be purchased in the year indicated. It is assumed that all investments take place at one-year intervals. Thus, animals purchased in year zero are in the herd during year 1, animals purchased in year 1 are in the herd during year 2, etc. Schematically for an investment made on December 31 (or January 1), this can be shown as



17c. Enter the net value of an average cull cow. This should reflect the average value received for cows culled from the herd. Selling costs should be subtracted from average gross value per cow. Consideration should be given to the fact that some animals culled are injured or in poor health at the time of sale.

18a. Enter the price per head that will be paid for animals purchased. If only raised animals are used to increase herd size, enter the value that could be received for raised animals used as part of the new investment and set assumption 58 at 100. If some animals are to be purchased and some raised, enter the average value of all purchased animals to be added to the herd and set assumption 58 at the level required to reflect any difference between the value of purchased and raised animals.

If young animals are purchased to increase the number of raised replacements available in future years, enter their value at the time they enter the milking herd. Always enter a price if herd size is increased by the investment even if no animals are to be purchased.

18b. Enter the average number of years that purchased animals are expected to remain in the herd. An entry must be made on this line if herd size is increased.

18c. Enter the percent of all animals included as part of the investment that will be replaced by purchased animals. If all replacements are to be raised, enter zero.

Note: When the budget generator is used, the costs generated will be based upon the assumption that the same percentage of replacements are raised after the investment as in the base year. If the number entered here differs significantly from the percentage of replacements purchased in the base year, budget costs will be over or under-estimated by the cost of the reduced or increased number of animals raised relative to a proportional change.

The percent entered here does not affect the replacements already being purchased as part of the business in the base year.

19. All portions of line 19 must be completed if purchased animals are part of the investment or if some of the animals that are part of the investment are replaced with purchased animals or if any yearlings are purchased.

19a. Enter the number of years over which purchased animals are to be depreciated. This must be less than or equal to the number of years to replacement (18b.).

19b. Enter the depreciation method to be used on all purchased livestock.

19c. Enter the salvage value to be used for livestock for tax purposes. If the value entered exceeds or is less than the cull price, the respective tax loss or gain is added to taxable income in calculating tax to be paid at the time the animals are sold.

19d. If the investment qualifies for Federal investment tax credit, enter "1"; if it does not, enter "0".

19e. If the investment qualifies for State investment tax credit, enter "1"; if it does not, enter "0".

20a. Enter the per cow value of the increase in herd size that is part of the investment. Enter the value in year 0 dollars. If cow values are being inflated, an actual dollar value will be calculated by inflating the value entered.

20b. Enter the average value of the additional heifers of all ages on hand at the end of the planning period as a result of the increased herd size. Enter the value in year 0 dollars.

20c. Enter the increase in number of heifers of all ages on hand at the end of the planning period as a result of the increased herd size.

Section V. Land Investment

All land or other non-depreciable real estate should be entered in this section. Space is provided for three separate land investments. If more than three parcels are purchased they should be grouped by year of purchase for entry.

21a. Enter the year that land item or group A will be purchased.

21b. Enter the total cost of land item or group A. Total cost should include all transfer costs and taxes involved in the purchase.

22. Enter the terminal value of land item or group A excluding any effect of general inflation on land values. This value should include any appreciation in land value due to location relative to population expansion centers or improvement in the quality of the land over the planning period. Any change in value due to general increases in the price level should be excluded.

23a. - 24. These lines correspond exactly with lines 21a. - 22 except that they apply to land item or group B.

25a. - 26. These lines correspond exactly with lines 21a. - 22 except that they apply to land item or group C.

Section VI. Income Tax and Cost of Capital Information

27a. Enter the before-tax cost of capital relevant to the owners of the business for which the investment is being made. The cost of capital should reflect the rate of return that could be earned if the money required to make this investment were not used for this investment but were invested in the alternative providing the highest return. For most businesses the cost of capital can be estimated as the weighted average of the rate of interest paid on borrowed capital and the rate of return that could be earned by equity capital in alternative investment, where the weights are the amount of debt and equity capital after the investment is made.

27b. Enter the marginal Federal tax rate that would be paid if the investment were not made. The program assumes that the business is at the midpoint of Federal tax bracket indicated (Table 2). The level of income is estimated from the Federal rate. If the income from the business is divided among more than one family (person), the marginal tax rate for all families (persons) should be averaged.

Table 2. MARGINAL INCOME TAX RATES
Married Filing Joint Return

Taxable Income		Marginal Tax Rates	Taxable Income		Marginal Tax Rates
Over	But Not Over	Federal	Over	But Not Over	Federal
$ 0	$ 1,000	14	$23,000	$24,000	32
1,000	2,000	15	24,000	25,000	36
2,000	3,000	16	25,000	28,000	36
3,000	4,000	17	28,000	32,000	39
4,000	5,000	19	32,000	36,000	42
5,000	7,000	19	36,000	40,000	45
7,000	8,000	19	40,000	44,000	48
8,000	9,000	22	44,000	52,000	50
9,000	11,000	22	52,000	64,000	53
11,000	12,000	22	64,000	76,000	55
12,000	13,000	25	76,000	88,000	58
13,000	15,000	25	88,000	100,000	60
15,000	16,000	25	100,000	120,000	62
16,000	17,000	28	120,000	140,000	64
17,000	19,000	28	140,000	160,000	66
19,000	20,000	28	160,000	180,000	68
20,000	21,000	32	180,000	200,000	69
21,000	23,000	32	200,000		70

27c. Enter a zero (00).

27d. Enter the appropriate state code (Ohio = 34). 53 is used to indicate no state taxes are used in the analysis.

27e. Indicate the number of tax families that will divide the net income from the business. The model will assume that all additional income generated by the investment is divided equally among the tax families.

Section VII. Projected Increase in Cash Flow

For dairy farm businesses the projected increase in cash flow provided by the investment can be either entered in this section or estimated by the computer program from entries in section VIII. For all other types of investments, increased cash flows must be entered in this section.

In calculating cash flows on livestock farms, exclude from income the value of calf and cull cow sales resulting from the investment. Exclude from the expenses the value of purchased replacements resulting from the investment. Each of these items is calculated by the model.

Five different cash flow levels can be entered, with each level occurring in as many consecutive years as desired. Cash flow entries must be made for each year of the planning period. An entry of "0" on line 28 indicates to the computer that cash flows will be estimated in section VIII. The total number of years for which cash flows are indicated on lines 28 - 32 must equal the planning period on line 1.

28a. Enter the number of years for which the first cash flow level will be received.

28b. Enter the before-tax net cash inflow level in dollars per year to be received during the years entered on line 28a.

29a. Enter the number of years for which the next cash flow level will be received.

29b. Enter the before-tax cash inflow in dollars per year to be received during the years entered on line 29a.

30 - 32. Enter the dollar value of each successive cash flow level and the number of years for which it is to be received.

Section VIII. Budget Projection Data

This section is a budget generator for projecting cash income and expenses for dairy farm businesses. It cannot be used to project cash flows for other types of farms. The budget generator operates on the assumption that a farmer's past experience is a reasonable indicator of his expected performance in future years. Thus, the data for a recent year, preferably the year immediately prior to the one in which the investment is made, is used as a basis for estimating the income and expense levels that would occur if the investment is made.

Data for the most recent year may need to be adjusted to develop appropriate base year input. Data should be adjusted for any irregularities that occurred during the year that are not expected to occur in future years.

Examples of such irregularities include:

(a) A feed bill carried over from the previous year that was paid off

(b) The expense for a fertilizer purchase that is normally made in December but was delayed until the next year

(c) Above normal corn yields that resulted in a below normal feed bill

(d) Lime expense for permanent pasture that is made only every four years

(e) A reduced labor bill because son John was laid-off from his job in town and worked for nothing on the farm during May and June.

The model assumes that the base year experience is what would occur in future years if the investment were not made. Use of a list of base year data adjustments and budget assumptions, like that illustrated on page 33, will assist in interpreting results generated.

33 - 43b. Enter all cash operating expenses for the base year. It is suggested that these items be added up and the total checked against total expenses for the year to be sure that all cash expenses are included in one of the categories.

44 - 46b. Enter all cash operating income for the base year. It is suggested that these items be added up and checked against total cash receipts for the year to be sure that all cash income is included in one of the categories.

47a. Enter the amount that is expected to be paid for hired labor in the fifth year. The value of assumption 11 determines whether the increase to this level occurs all in one year or is proportional to the increase in cow numbers.

48a. Enter the number of acres of corn (silage and grain) grown in the base year.

Note: A 0 must be entered on every line for lines 48 thru 55 if no other entry is required.

48b. - 49c. Enter the number of acres of corn (silage and grain) to be grown in the year indicated.

50a. Enter the number of acres of hay crops grown in the base year. Hay crops include hay, hay crop silage, annuals (other than corn) that were ensiled or pastured and cropland pasture.

40b. - 51c. Enter the acres of hay crops to be grown in the year indicated.

52a. Enter the acres of feed crops other than hay crops and corn that were grown in the base year. Other feed crops include such crops as oats, barley, rye and grain sorghum.

52b. - 53c. Enter the acres of other feed crops to be grown in the year indicated

54a. Enter the acres of non-feed crops grown in the base year. Non-feed crops include all crops that are not or cannot be fed to livestock. Examples include vegetables, wheat and soybeans. If wheat or soybeans are used for feed, they should be included other feed crops in lines 52 and 53.

54b. - 55c. Enter the acres of non-feed crops grown in the year indicated.

56a. Enter the percent of total crop sales entered on line 46 that resulted from the sale of non-feed crops grown in the base year as indicated in line 54a.

56b. Enter the market value of land and buildings owned by the business in the base year. This number is used in estimating taxes, insurance, and building and fence repair costs.

57a. Enter the average pounds of milk sold per cow during the base year.

57b. Enter the average number of cows on hand during the base year. This number can differ from the number indicated on line 14a.

58a. Enter the number of acres of additional cropland that will be rented if the investment is made. If no additional cropland is rented, enter "000".

58b. Enter the number of the first year in which the cropland is to be rented. Rental must start in one of the first five years of the planning period.

58c. Enter the rental rate (dollars per acre), that is to be paid for the cropland to be rented. Even if rental is not to start in the first year, the value entered should be in year zero dollars. If values are to be inflated, the model will calculate the actual rate for each year.

Section IX. Modification of Assumptions

A number of coefficients are used by the model in making its calculations. Those coefficients that are likely to be similar for a number of different farm situations are stored in the computer and called assumptions. A list indicating the value assumed for each of the assumptions used in this program is presented in Table 1. Table 1 is presented on pages 3 thru 6 to make it easy to find. If any of the values assumed by the model are inappropriate for the situation being considered, these values can be replaced with more appropriate values.

Replacement of values assumed by the model is accomplished by making entries in lines 59 through 68. On the "a" part of the line (i.e., 59a.) enter the new value that is to replace the assumed value. On the "b" part of the line enter the assumption code corresponding to that assumption. On the input line following the last assumption modification enter zero (unless the last modification fills line 68). If no assumptions are to be modified, enter a zero on line 59.

For example, if the price of cull calves is expected to be 20 percent of the cull cow price (assumption 01) instead of the 12 percent assumed by the model, the 12 percent can be replaced by 20 percent by making the following entry on line 59.

59a. Assumption value desired 59. _ _ _ _ 2 0 . 0 | 0 1

b. Assumption code _____

Any line in Section IX. can be used to change any of the assumptions as long as all previous lines are used.

ADJUSTED ANALYSES

Most investment decisions will require one or more adjusted analyses. An adjusted analysis is made by going through the input lines and entering new values in the analysis 2 column for each input line in which change is required. If any part of a line is changed, the entire line must be entered in the analysis 2 column. Lines that are not to be altered are not reentered. The line numbers for all lines that were changed are then entered in numerical order on line 69. For example, if an analysis had been made using a 10 percent cost of capital and there was some uncertainty about whether the true rate might be 12 percent, an adjusted analysis should be run. This would be done by entering 1 2 , 2 2 , 1 0 | 3 1 , 1 in line 27 and entering 2 7 , 0 0 on line 69 of the second analysis column. Any number of adjusted analyses can be run.

It is important to remember that each adjusted analysis builds on the previous one. Thus, if the farmer in the above example also wanted to know the effect of a reduction in his cash flow estimates from $12000 per year to $11000 per year, he could do this by entering the new value (say 1 0 , 0 1 1 0 0 0) in line 28 and 2 8 , 0 0 in line 69 in the column for the third analysis. However, if he did this, the third analysis would use the 12 percent cost of capital used in the second analysis. If it is desired that the 10 percent rate be used in analysis 3, the original values for line 27 must be reentered in column 3. In this case line 69 will read 2 7 , 2 8 , 0 0.

There are at least two important cases where adjusted analyses should be used. The first is where the true value of an input coefficient is in doubt. The appropriate procedure in this instance is to use the best estimate of the correct value in the main analysis and then run an adjusted analysis with the coefficient set at the other value or values it may take. This procedure is illustrated in the above paragraph.

A second case is where a different combination of investment items is to be considered. For example, a farmer might consider increasing his herd size by only 50 cows instead of 75, or using a smaller combine and accepting higher losses and labor costs.

In analyzing any problem it is important that significant effort be made to anticipate all alternatives that should be considered. Only if this is done will a satisfactory answer to a real problem be possible with one set of analyses by the computer.

EXPLANATION OF OUTPUT

The amount of information printed out as the results of each analysis depends upon the computer accessing device being used. The first section of explanation of output refers to the information that will be printed with either batch processing or a printing terminal. Only part of this information is printed out on touch-tone terminals. The discussion below is labeled according to information item printed out and these labels are referred to in the explanation of touch-tone output that appears on page 24.

Batch or Printing Terminal

(See example on page 45)

Investment analysis results

1. Net present value of the investment is the economic return in discounted dollars, over the planning period, if the investment is made. That is, this is the number of dollars that, if received today, would be equivalent to the net income above all costs generated by the investment over the entire planning period. This is calculated as the sum of (1) total of the present value of after-tax net cash flows, (2) present value of after-tax terminal value of all investments, and (3) present value of investment tax credit, minus the total of the present value of all investment outlays. If this value is positive, the investment is a profitable one and it should be given serious consideration. 1/ However, it should be stressed that the answers are dependent upon the input values entered and, therefore, the quality of any answer is only as good as the data entered (garbage in - garbage out).

2. Percent after-tax cost of capital is the discount rate used in calculating the net present value of after-tax cash flows. An after-tax cost of capital is used to reflect the fact that any return on invested capital will be taxed, and thus the return given up by investing the money in this investment rather than another is less than the before-tax return by the amount of that return that would be paid in taxes.

   The after-tax cost of capital is calculated as the before-tax cost of capital multiplied by one minus the tax rate expressed in decimal form. That is, if the tax rate is 40 percent and the before-tax cost of capital is 10 percent, the after-tax cost of capital is 6 percent or 10 multiplied by (1 - .4). The tax rate used in this case is the average tax rate paid on the additional income generated by the investment.

1/ For a detailed explanation of the net present value method see Aplin, R. D. and G. L. Casler, Capital Investment Analysis: Using Discounted Cash Flows, Grid, Inc. 1973.

3.1 Before-tax cash flow is the total net cash inflow to the business resulting from the investment being considered. When the projected cash flows are entered on lines 28-32, (the budget generator is not used), the before-tax cash flow for each year is calculated as the value entered on lines 28-32 plus livestock sales (cull cow and calf sales) generated by the investment, minus the cost of purchased replacements that are made necessary by the investment. Purchased replacement calculations are explained in section 6 below. If the budget generator is used, before-tax cash flow is the estimated net income with the investment minus the net income from the business if the investment were not made (base year income, adjusted for inflation when applicable).

3.2 Depreciation is the total depreciation to be taken for all items included in the investment. This includes the additional 20 percent first-year depreciation where applicable. To calculate total depreciation the computer develops a depreciation schedule for each investment and then sums the depreciation for all items for each year. Items using double declining balance and 1.5 declining balance methods are switched to straight line in the first year that the straight line method gives a higher amount of depreciation.

3.3 Taxable income is the increase in taxable income resulting from the investment. It is calculated as the before-tax cash flow minus depreciation with five adjustments. The first adjustment reduces taxable income to reflect capital gains treatment of some livestock sales. This is accomplished by subtracting half of the income from the sale of raised livestock from before-tax cash flow minus depreciation. Animals purchased as yearlings are not considered to be raised animals.

For the second adjustment, the cost of purchased replacements is added to taxable income. (This is equivalent to subtracting the cost of purchased replacements from expenses before computing before-tax cash flow.) This is required because depreciation on these animals is included in total depreciation. Adding purchases to taxable income avoids the double counting that would occur if both cost and depreciation were included as costs.

The third adjustment subtracts the sale value of purchased cows sold from taxable income. The salvage value is not taxable income because it represents the return of money invested at the time the cow was purchased. Only the amount that the cull price exceeds the salvage value is taxable. Alternately, if the cull price is less than the salvage value, a loss is incurred at the time of the sale. This gain or loss is handled in adjustment four.

The fourth adjustment changes cash flow to reflect the difference between the tax salvage value used for purchased cows and the actual cull price received. If the cull price exceeds the salvage value used and an animal is sold after being fully depreciated, the amount by which the cull price exceeds the salvage value is ordinary gain and is thus added to taxable gain. If the salvage value exceeds the cull price, the difference is subtracted from taxable gain. If the cull price exceeds the purchase price, only half of this difference is added to taxable income since this income is subject to capital gains.

For the fifth adjustment, the sale value of purchased yearlings that are sold is subtracted from taxable income. Half of the amount by which the sale price of purchased yearlings (cull price) exceeds the purchase price for those yearlings is added to taxable income because this income is subject to capital gains. The difference between the cull or purchase price, whichever is smaller, and the salvage value is added to taxable income since this reflects income that is taxable as ordinary gain (or loss if the result is negative).

3.4 Tax is the amount of federal paid on the increase in taxable income explained above. To calculate personal income taxes, the marginal federal tax bracket entered on line 27 is used to indicate the level of income if the investment is not made. Specifically, the level of income at the middle of the federal tax bracket indicated is used as the base. That base income is adjusted upward to get the level of income that would have been necessary in order for the taxpayer to have paid federal taxes on that base income (itemized deductions are assumed). If more than one operator is involved in the business, the taxable income is divided by the number of tax families before federal income taxes are calculated. After federal income taxes are calculated they are multiplied by the number of federal income taxes are calculated they are multiplied by the number of tax families. Total tax as printed out as part of the results of each analysis is federal income taxes only.

3.5 After-Tax Cash Flow is the Before-Tax Cash Flow explained in section 3.1 minus the increased taxes that would be paid.

3.6 "Present Value" is the present value of the after-tax cash flows. It is the value in today's dollars of the cash flows generated during each year of the planning period, after adjusting for the taxes that would be paid on that increased income. The "present value" for each year is calculated by discounting the after-tax cash flow received in that year with the after-tax cost of capital.

3.7 "Total present value" is the arithmetic sum of the present value of after-tax cash flows for all the years of the planning period.

4.0 Investments (outlays) are printed out only for years in which there are one or more investments. Purchases that are required to replace part of the initial investment are included.

4.1 Building, equipment and land outlays indicate the amount of investment made each year to purchase and/or replace investment items indicated in the input.

4.2 Cattle outlays are divided into two parts, (1) investment in purchased cattle and (2) the value of raised animals that are part of the investment. The value of purchased cattle in any year is the number of animals purchased that year multiplied by the purchase price per head.

The model assumes that for every cow increase in herd size one additional animal must be purchased or an extra raised animal added to the herd. Thus, the number of raised animals that must be included as part of the investment is calculated for each year as the increase in herd size minus the number of purchased animals. The value of these raised animals is calculated as the number of animals multiplied by the purchase price per head for purchased animals.

Cattle outlays also include investment required for yearlings added at the time herd size is increased. The value of yearlings is calculated as the number of yearlings purchased or raised multiplied by the respective price for each.

4.3 Total investment or outlay for each year is the sum of all buildings, equipment, purchased cattle, raised cattle and land investments made in that year.

4.4 The "Present value" column indicates the present value of total investments or outlays for each year. This is the economic cost in today's dollars of the investment made in each year of the planning period. These values are calculated by discounting the total investment for each year by the after-tax cost of capital.

4.5 "Total present value" is the sum of the present value of the total investment for all of the years of the planning period.

4.6 Terminal value before-tax indicates the remaining value of all the items in each of the investment categories (buildings, equipment, cattle and land) at the end of the planning period. For buildings and equipment this is the undepreciated value of the buildings and machines purchased as part of the investment. The before-tax terminal value of cattle is the increase in herd size multiplied by the value per cow at the end of the planning period indicated on line 20a., plus the increase in heifer numbers multiplied by the average value per heifer at the end of the planning period from line 20b. The terminal value of land is the sum of the terminal values for each of the land purchases indicated as part of the input.

4.7 After-tax terminal value is the value of the investment at the end of the planning period minus taxes that would be paid if those items were sold at the end of the planning period.

There is no taxable gain on buildings and equipment because their value if sold is assumed to be equal to their tax basis (undepreciated balance). However, the amount by which the terminal value of land exceeds its cost is taxable. Since the income is taxable as capital gains, one-half the increase in value is multiplied by the tax rate. The tax thus calculated is then subtracted from the before-tax terminal value of land to get the after-tax terminal value.

The taxable income generated by the hypothetical sale of cattle is calculated as one-half the value of raised animals plus the taxable income from the sale of animals that were purchased. The value of raised animals is the total increase in the value of the herd minus the value of animals purchased in the last "X" years where "X" is the number of years to replacement for purchased cows. Taxable income from the sale of purchased animals is the difference between the undepreciated balance for those animals purchased in the last "X" years and their terminal value, divided between capital gain and ordinary income as appropriate. The taxable income is multiplied by the tax rate and the resulting tax subtracted from the before-tax terminal value to get the after-tax terminal value of cattle.

For both cattle and land, the tax rate used is the average marginal rate paid on increased income resulting from the investment. This is the same rate that is used in calculating the after-tax cost of capital.

4.8 Present value of the after-tax terminal value of investments indicates the value in today's dollars of the money that would be received if the items purchased as part of the investment were sold and the required taxes paid on the gain from the sale. While these items may or may not be sold at the end of the planning period, the increased value represents gain on which taxes will have to be paid sometime. The present value of the after-tax sale value of these items is likely a good approximation of the remaining value of investment items regardless of when they are sold.

5.1 Investment tax credit is the amount of investment tax credit that would be earned if the investment were made. This includes both federal and state investment credit, including state investment tax credit that is used to offset unincorporated business tax. Information is printed out for years in which investment credit is earned.

5.2 Present value of investment tax credit is the value of the investment tax credit earned by the investment in terms of today's dollars. This is the value of the investment tax credit after discounting at the after-tax cost of capital. In calculating this value it is assumed that the tax credit is used in the year it is earned.

6.0 Two types of budget information may be printed out. When the budget generator is not used, the budget information includes only the livestock information generated by the model and a cash flow summary. This is explained in 6.1 below. When the budget generator is used the complete budget for the first five years of the investment are printed out. This section is explained in section 6.2 below.

Budget generator not used.

6.1.1 Purchased replacements indicates the amount spent to replace animals purchased as part of the investment. This does not include any replacements that have been or may have to be purchased for the existing herd. Purchased replacements for each year is calculated by first calculating added replacements required as the increase in herd size in the prior "years to replacement" years and then dividing by the number of years to replacement. The number of purchased replacements is added replacements multiplied by the percent to be replaced with purchased animals from input line 18c. The price per head for purchased animals is used to calculate the value of purchased replacements.

6.1.2 Livestock sales indicates the increase in cull cow and calf sales resulting from the increase in herd size which is part of the investment. The increase in number of cows sold is calculated as the increase in herd size divided by the number of years to replacement. This implies a culling rate of 33 1/3 percent with three years to replacement, a 25 percent culling rate with four years to replacement, and so forth. The value of the additional cows culled is calculated as the number culled multiplied by the price indicated on input line 17c.

Increase in calves sold is calculated using assumption 02 and the increase in herd size. The value of calves is determined from assumption 01 and the cull price entered on line 17c.

6.1.3 Input cash flows is the level of cash flows entered on lines 28 through 32.

6.1.4 Increase in cash flow is the total increase in net cash flow resulting from the investment. It is calculated as the input cash flow plus livestock sales minus purchased replacements. Increase in cash flow is the before-tax cash flow used in section 3.1 above.

Budget generator used

6.2.1 When the budget generator is used, values for all income and expense categories are printed out for each of the first five years of the investment. The method used to estimate each of the income and expense items is indicated in the section entitled Method of Estimating Cash Flow Values for Dairy Budget Generator.

6.2.2 Increase in cash flow indicates the amount that net income is increased by the investment over what it would be with the base year business under the same price, cost and inflation conditions. Under conditions of zero inflation, increase in cash flow is the difference between base year net income and budgeted year net income. However, if a positive rate of inflation is assumed, increase in cash flow is the budgeted year net income minus base year net income calculated with the inflated prices and costs appropriate for the budgeted year. Increase in cash flow is the before-tax cash flow used in section 3.1 above.

Warnings

7.1 In calculating the net present value of the investment, the model assumes that there is sufficient tax to be paid that all investment tax credit can be taken in the year it becomes available, or that sufficient taxes have been paid in previous years that the investment tax credit can be used by carrying the tax credit back to previous years. However, the model has no way of knowing whether this is true. Thus, the years for which the tax credit exceeds the total tax due from the business, including the investment, are determined. If there are any such years, the message shown below is printed followed by a listing of the specific years for which tax credit exceeds estimated tax.

INVESTMENT TAX CREDIT EXCEEDS TAX TO BE PAID IN YEARS:

7.2 Unprofitable investments, investments with large negative cash flow in one or more years or investments with a large amount of depreciation to be taken in one year can provide the business with losses (negative total taxable income, including income without the investment) in one or more years. Tax law allows these losses to be carried backward or forward. Since the level of taxable income in years previous to model year zero are unknown to the program and since losses frequently occur in the first few years, the model does not attempt to move losses forward or back. If there are losses, the message shown below is printed followed by a listing of the specific years in which losses occur.

LOSSES INCURRED BUT NOT CARRIED FORWARD OR BACK IN YEARS:

7.3 The amount of special 20 percent first-year depreciation that can be taken in any one year is limited to depreciation on $20,000 per tax paying family, assuming a joint return is filed. If the amount of investment on which special 20 percent first-year depreciation is indicated exceeds $20,000 times the number of tax families, the following message is printed out, followed by the number of the specific years in which this occurs.

SPECIAL 20 PC FIRST YEAR DEPRECIATION TAKEN

EXCEEDS ALLOWABLE LIMITS IN YEARS:

Touch-tone Terminal

(See example on page 54)

Each result provided by the touch-tone terminal corresponds to a part of the output generated for batch and printing terminals. For those result items that are identical to a printing terminal output item, only the section number where that output item is explained is given.

Result 1:	Section 1
Result 2:	Section 2
Result 3 - 12:	The first ten years of after-tax cash flows as explained in section 3.5
Result 13:	Section 3.7
Result 14 - 23:	Section 4.3. Data will be provided only for the first 10 years in which investments take place
Result 24:	Section 4.5
Result 25 - 28:	Section 4.6
Result 29:	Section 4.8

Result 30 - 34:	Section 5.1
Result 35:	Indicates the total amount of investment tax credit generated by the investment over the planning period.
Result 36:	Section 5.2
Result 37 - 63:	Section 6.2.1
Result 64:	Sections 6.1.4 and 6.2.2
Result 65:	Sections 7.1, 7.2 and 7.3 except that the program gives the number of years the condition holds instead of indicating the specific years in which the condition is incurred.

Error Messages

If a questionable input entry is made or an inconsistency is found in the data input, an error message is given. For some errors the input information must be corrected before an analysis can be made. For other errors the message is just a warning that the input information may be incorrect. Printing terminals will print out the message indicated. Touch-tone terminals will indicate that an "error occurs in input value X," where X is the number of the input line where the error occurs. With touch-tone terminals, all errors, including warnings, must be corrected before the analysis can be carried out.

The errors and an explanation of their causes are listed below. The line number in parentheses after each error message indicates the input value number that touch-tone terminals will give if this error occurs. When no line number is indicated, the error may occur with a number of different input values. Some input value numbers may correspond to a number of different errors.

1. * LINE "X" TOO LOW AND IS IGNORED

   "X" indicates the line number of a line of data that has been entered after data for a higher line number has been entered. This may reflect an attempt to reenter a line or entry of data out of order. The data being entered for line X will be ignored. If the data should be included, it should be entered as a data correction after all data is read in. Analysis will be carried out unless other errors are found.

2. *** FIRST LINE = "X", PLANNING PERIØD MISSING (1)

   The first line is missing. "X" indicates the number of the first line read in. The program cannot run without the planning period specified.

3. *** LINE 27 MISSING (27)

Line 27 is missing. The Program cannot run without cost of capital and tax rate information.

4. * ZERO MISSING AFTER LINE "X"

"X" indicates the last line read in for a section. The next line read is in the next section. If the line following line number "X" should have been a zero, no change is required. However, if data should have been entered on the line following line "X", the correction should be made before analysis is completed.

5. *** LINES MISSING BETWEEN LINE "X" AND LINE "Z"

This error indicates that data required for the problem has not been entered. "X" indicates the line entered before the missing data, "Z" indicates the next line number read. For example, if a building cost and year of purchase are indicated on line 2, line 3 data must be entered. If line 4 was entered immediately after line 2, the error message would be *** LINES MISSING BETWEEN LINE 2 AND LINE 4.

6. *** PLANNING PERIØD LESS THAN 1 YEAR (1)

A planning period of less than one year has been entered. The shortest planning period the model can use is one year.

7. *** PLANNING PERIØD GREATER THAN 25 YEARS (1)

A planning period of more than 25 years has been entered. The longest planning period the model can use is 25 years.

8. *** DEPRECIATION YEARS "Y" EXCEEDS REPLACEMENT YEARS "Z" IN LINE "X"

The number of years that an item is depreciated over must be equal to or less than the number of years it is to be used.

9. *** INAPPROPRIATE DEPRECIATION TYPE "Z" IN LINE "X"

Depreciation type must be a number 1 through 9. In most cases where this error occurs "Z" will be zero indicating that a depreciation type has not been indicated.

10. *** YEAR OF PURCHASE "Z" IN LINE "X" NØT IN PLANNING PERIØD

All items that are part of the investment must be purchased during the planning period. "Z" indicates the purchase year entered.

11. *** CULL COW VALUE "Z" EXCEEDS PURCHASE PRICE "Y"

Cull cow price must be less than or equal to the purchase price per head.

12. *** PERCENT OF COWS REPLACED WITH PURCHASED ANIMALS "Z" EXCEEDS 100

Percent of replacements to be purchased must be 100 or less. "Z" indicates the percentage entered. This message will normally indicate incorrect entry of data.

13. *** COW DEPRECIATION YEARS "Z" EXCEEDS YEARS TO REPLACEMENT "Y" IN LINES 18 AND 19

Cows cannot be depreciated over more years than they are expected to be kept in the herd.

14. *** COW SALVAGE VALUE "Z" EXCEEDS PURCHASE PRICE

The salvage value used for depreciation purposes cannot exceed the purchase price. "Z" indicates the salvage price entered.

15. *** SUM OF CASH FLOW YEARS IN LINES 28-32 DOES NOT EQUAL PLANNING PERIOD

The number of years for which cash flows are entered on lines 28 through 32 must equal the planning period. If there are years of zero cash flows, these must be included.

16. *** ASSUMPTION CODE "Z" USED IN LINE "X" DOES NOT EXIST

Only assumption codes listed in the "list of assumed values" can be used. "Z" is a code number which is not on the list.

17. *** CANNOT USE BUDGET GENERATOR - NUMBER OF COWS IN BASE YEAR IS ZERO

A number of calculations used in the budget generator require the number of cows in the base year. Thus, the generator cannot be used unless the base year number of cows is greater than zero.

METHOD OF ESTIMATING CASH FLOW VALUES FOR BUDGET GENERATOR

The budget generator estimates each budget cash flow value individually. All budgeted values are based on the base year performance and other input data. The listing below indicates the method used to estimate each cash flow item. The procedures outlined do not include inflation adjustments. If values are to be inflated, they are calculated as indicated below and then modified to reflect the inflation rates indicated in assumptions 29 and 60 through 81.

Expenses

Labor	Labor is increased from base year value to the final value (input line 47) in proportion to the increase in cow numbers unless assumption code 11 is set to 1 through 5. In this case, the total increase occurs in the year entered for assumption value (i.e. years 1 through 5).
Feed	Feed cost per cow, acres of corn per cow, acres of hay crops per cow and acres of other feed crops per cow are calculated for the base year. Feed cost per cow for each year is calculated as base year feed cost per cow multiplied by the number of cows, plus or minus any deficit or excess acres of each crop multiplied by the feed value of that crop (assumption codes 12, 13 and 14). If feed crops were sold in the base year, the deficit is adjusted for that portion of feed crop acres used to produce crops sold. In addition, an allowance is made for feed crop sales generated by a change in acreage from base year data. If assumption code 15 is 0, any deficit in crop production will be subtracted from feed crop sales before feed costs are increased.
Machine hire	Cost per acre of corn, other feed crops, and non-feed crops (excluding hay) from base year multiplied by acres of corn, other feed crops, and non-feed crops.
Machine repairs	Maximum of (1) cost per crop acre from base year multiplied by the number of crop acres in each year or (2) minimum marginal machine cost with increased herd number (assumption code 16) multiplied by number of cows.
Auto expense	Base year expense per cow times number of cows up to maximum percent increase indicated in assumption 17.
Gas and oil	Base year cost per acre times number of crop acres with a minimum percent increase equal to the percent increase in machine repairs.
Purchased replacements	Base year value plus replacement purchases made necessary by new investment in cattle.
Breeding fees	Base year cost per cow times number of cows.
Veterinary and medicine	Base year cost per cow times number of cows.
Other livestock expense	Base year cost per cow times number of cows.
Lime and fertilizer	Data in assumption codes 18, 19, and 20 are used to calculate lime and fertilizer "corn equivalents 1". Lime and fertilizer per "corn equivalent 1" in base year is multiplied by "corn equivalent 1" acres for each year.

Seeds and plants	Base year cost per "corn equivalent 2", calculated using assumptions 21, 22, and 23 multiplied by "corn equivalent 2" acres for each year.
Spray and other crop expense	Base year cost per "corn equivalent 3",calculated using assumptions 24, 25, and 26 multiplied by "corn equivalent 3" acres for each year.
Land, building, and fence repair	Base year cost per dollar of real estate investment times total investment (base year value of real estate plus average value of buildings over their life plus land purchases).
Taxes	Base year cost per dollar of real estate investment times total investment.
Insurance	Base year cost per dollar of real estate investment times total investment.
Rent	Base year value plus rental indicated in line 58.
Telephone and Electricity	Cost per cow in base year times number of cows.
Miscellaneous	Same percent of total expenses as in base year.

Income

Milk sales	Milk price in base year times amount of milk produced (# cows times production level) as adjusted by assumptions 27 and 28.
Livestock sales	Base year livestock sales plus additional value of livestock sold as a result of livestock investments included as part of the investment.
Crop sales from feed crops	Base year sales per feed crop acre (corn plus hay plus other feed crops) times number of feed crop acres, minus adjustments for feed deficits as indicated in feed costs. Base year sales = (crop sales) (1 - % of crop sales from non-feed crops).
Non-feed crop sales	Base year value per acre is calculated as total crop sales multiplied by "percent of crop sales from non-feed crops" divided by number of acres of non-feed crops. Budget value is base value per acre multiplied by acres of non-feed crops for each year.
Miscellaneous	Same percent of total receipts as in base year.

(This page is intentionally blank)

EXAMPLE

Background Information

Kenneth Kase, the operator of a 61-cow dairy farm, is considering an expansion in herd size to 100 cows. He has estimated that the following items would be needed:

Barn addition	$42,000
24' x 65' silo	15,000
Silo unloader and conveyor	3,500
Extension of pipeline milker	2,000
Gutter cleaner	3,000
Forage harvester	4,000
Other small items	1,500

The herd would be gradually expanded to 100 cows by a combination of raised and purchased cows. Purchase price is estimated to be $500 per head. Actual number of animals purchased and average number of cows for each year is listed below.

Year	Number of Cows Purchased	Average Number of Cows
0	10	--
1	5	80
2	5	85
3	5	90
4	0	95
5-15	0	100

Ken is in the 22 percent Federal tax bracket and has a before-tax cost of capital of 11 percent. He wants to use a 15-year planning period.

Ken's wife says he can expand the dairy herd only if he remodels her kitchen. She would be satisfied with the old kitchen if no expansion is made. Therefore, Ken wants to consider the $2,000 as part of the investment required; but, of course, it is not depreciable for tax purposes and not eligible for investment tax credit.

Twenty acres would be rented to provide roughage needed. The cropping program is indicated below.

Cropping Program

Crop	1974 Acres	Planned Future Acres
Corn for silage	26	80
Corn for grain	10	0
Oats	11	0
Hay, 1st cut	68	80
Hay, 2nd cut	(40)	?
Hay, pastured	25	0
	140	160

FARM BUSINESS SUMMARY
Kenneth Kase Farm

CAPITAL INVESTMENT

Item	Begin.	End
Livestock	$ 34,500	$ 37,500
Feed & supplies	6,000	7,700
Machinery & equipment	23,375	27,000
Land & buildings	62,500	69,000
TOTAL	$126,375	$141,200

EXPENSES

Labor	
Hired labor (21 mo.)	$ 7,000
Feed	
Dairy concentrate	13,600
Hay and other	0
Machinery	
Machine hire	200
Machinery repairs	2,500
Auto expense (farm share)	400
Gas & oil	3,100
Livestock	
Purchased livestock	900
Breeding fees	800
Veterinary and medicine	500
Milk marketing	700
Other dairy expense	900
Crops	
Lime & fertilizer	1,200
Seeds & plants	800
Spray, other crop expense	100
Real Estate	
Land, building, fence repair	900
Taxes	1,100
Insurance	850
Rent	0
Other Cash Expense	
Telephone (farm share)	150
Electricity (farm share)	700
Interest paid	800
Miscellaneous expense	200
TOTAL CASH EXPENSES	$ 37,400
Non-Cash Items	
Depreciation of machinery*	3,525
Depreciation of buildings**	1,000
Unpaid labor (5 mo.)	1,750
Interest on farm equity @ 7%	8,900
TOTAL FARM EXPENSES	$ 51,175

*Machinery purchased = $7,150; sold = $0
**Real estate purchased = $0

RECEIPTS

Milk sales	$59,900
Dairy cattle sold and calves & other livestock sales	6,000
Crop sales	1,400
Miscellaneous receipts	800
TOTAL CASH RECEIPTS	$68,100
Increase in livestock	3,000
Increase in feed & supplies	1,700
TOTAL FARM RECEIPTS	$71,400

FINANCIAL SUMMARY

Net Cash Farm Income	
Total Cash Receipts	$66,700
Total Cash Expenses	36,000
NET CASH FARM INCOME	$30,700
Labor & Management	
Total Farm Receipts	$71,400
Total Farm Expenses	51,175
LABOR & MANAGEMENT INCOME	$20,225

BUSINESS FACTORS

Man equivalent	3.2
Number of cows	61
Number of heifers	43
Lbs. of milk sold	726,000
Lbs. of milk sold/cow	11,900
Lbs. of milk sold/man	227,000
Cows per man	19
% Feed is of milk sales	20
Av. price/cwt. milk	$8.25
Feed purchased per cow	$ 223

CROPS GROWN

	Acres	Yield per acre	Total
Corn for silage	26	16 t	420 t
Corn for grain	10	75 bu	750 bu
Oats	11	68 bu	750 bu
Hay, 1st cut	68		
Hay, 2nd cut	(40)	3.3 t	224 t
	115		

Most of the entries in Sections I thru VI are simple transfer of data from the above list to the input form with appropriate entries relative to depreciation, investment tax credit and replacement. Since there were more than three equipment items some grouping was required. The forage harvester and gutter cleaner were judged to have similar lives and thus were grouped together. For similar reasons, the pipeline and other small items were grouped together.

The farm business summary for the Kenneth Kas farm for 1974 is shown on page 32. This set of receipts and expenses would approximate the base year data for the farm if it continued to operate with 61 cows. The receipts and expenses have been entered on the appropriate lines of the input form, with the following exceptions where adjustments have been made:

Line 35b. Machinery repair in 1974 was abnormally high. For the base year, it was reduced to $1400, which is more realistic considering repair bills in years previous to 1974.

Line 36b. The gas and oil expense was reduced from $3100 to $1500 for the base year. Late in 1974, Mr. Kase had purchased a large amount of fuel for use in 1975.

Note that total expenses shown on page 8 of the input form are not the same as total cash expenses in the farm business summary. Interest paid is not included as an expense in the budget generator input. In this example, adjustments in expenses will also make the two totals differ.

BASE YEAR DATA ADJUSTMENTS

1. Machine repair in 1974 was abnormally high. Based on experience in previous years, $1400 per year is a more realistic estimate of machinery repair costs with 61 cows & the 1974 cropping program.
2. Late in 1974, Mr. Kase purchased $1600 of fuel for use in 1975. This is not nominal practice and thus the true 1974 gas and oil expense was $1500.
3.
4.

BUDGET ASSUMPTIONS

1. Additional labor will not be required to handle the added cows. Increase in herd size is designed to use presently excess labor.
2. Yearling price will be $250 per head. Therefore, assumption 56 was changed to 50%.
3. 40% of yearlings will be purchased. (assumption 57)
4. If increase in herd size cannot be handled with present labor force and an additional man is required, hired labor costs will be $14,000 per year. (See Analysis 2)

ACCESS PROGRAM 50 (Form 1)

COMPUTERIZED PLANNING FOR DAIRY FARMS

PROGRAM 05001 Phone _____ Date _____

NAME KENNETH KASE (24 characters maximum) Address _____

INVESTMENT EXPANSION OF DAIRY HERD BY 40 COWS (40 characters maximum)

	LINE NO.	ANALYSIS 1	ANALYSIS 2
Section I.			
1. a. Planning period (years)	01.	15	
Section II. Building Investment Information. (Up to 3 buildings or categories of buildings may be specified. If no buildings are involved, enter a "0" in line 2 and proceed to line 8.)			
2. Item or group A Barn Addition			
a. Total cost	02.	042000.00	
b. Year of purchase (0 = beg. of planning period; 1 = end of 1st year, etc.)			
3. a. Depreciation years	03.	15.00	
b. Salvage percent		.10	
c. Depreciation type; 1=Straight line; 2=Straight line with additional 20%; 3=Double decline balance; 4=Double decline balance with additional 20%; 5=1.5 decline balance; 6=1.5 decline balance with additional 20%; 7=Sum-of-digits; 8=Sum-of-digits with additional 20%; 9=Non-depreciable items.		1	
d. Does investment qualify for Federal investment tax credit? (0 = no; 1 = yes)		1	
e. Does investment qualify for State investment tax credit? (0 = no; 1 = yes)		1	
f. Years to replacement (if not to be replaced, enter 0). 1/		00	

1/ Model will replace the item or group the number of times required to complete the planning period.

	LINE NO.	ANALYSIS 1	ANALYSIS 2

4. Item or group B 24'x 65' Concrete Stave Silo
(if none is to be considered, enter "0" on line 4 and proceed to line 8).

a. Total cost — 04. 015000.00

b. Year of purchase — 0
(0 = beg. of planning period;
1 = end of 1st yr., etc.)

5. a. Depreciation years — 05. 15.00

b. Salvage percent — 1

c. Depreciation type — 1
(see 3c for types)

d. Federal ITC — 1
(0 = no; 1 = yes)

e. State ITC — 1
(0 = no; 1 = yes)

f. Years to replacement — 00
(if not to be replaced,
enter 0). 1/

6. Item or group C Repair Kitchen for Wife
(if none is to be considered, enter "0" on line 6 and proceed to line 8).

a. Total cost — 06. 002000.04

b. Year of purchase — 4
(0 = beg. of planning period;
1 = end of 1st year, etc.)

7. a. Depreciation years — 07. 00.00

b. Salvage percent — 9

c. Depreciation type — 0
(see 3c for types)

d. Federal ITC — 0
(0 = no; 1 = yes)

e. State ITC — 0
(0 = no; 1 = yes)

f. Years to replacement — 00
(if not to be replaced, enter 0). 1/

1/ Model will replace the item or group the number of times required to complete the planning period.

LINE NO.		ANALYSIS 1	ANALYSIS 2
	Section III. Equipment Investment Information. (Up to 3 items or categories of equipment may be specified. If no equipment is involved, enter a "0" on line 8 and proceed to line 14.)		
8.	Item or group A: Silo Unloader + Conveyor		
	a. Total dollar cost	08. 00350000	
	b. Year of purchase (0 = beg. of planning period, 1 = end of 1st year, etc.)		
9.	a. Depreciation years	09. 08 10 2 1 1 08	
	b. Salvage percent		
	c. Depreciation type (see 3c for types)		
	d. Federal ITC (0 = no; 1 = yes)		
	e. State ITC (0 = no; 1 = yes)		
	f. Years to replacement (if not to be replaced, enter 0). 1/		
10.	Item or group B: Pipeline + "other" equipment (If none is to be considered, enter "0" on line 10 and proceed to line 14.)		
	a. Total dollar cost	10. 00350000	
	b. Year of purchase (0 = beg. of planning period, 1 = end of 1st year, etc.)		
11.	a. Depreciation years	11. 10 10 1 1 1 10	
	b. Salvage percent		
	c. Depreciation type (see 3c for types)		
	d. Federal ITC (0 = no; 1 = yes)		
	e. State ITC (0 = no; 1 = yes)		
	f. Years to replacement (if not to be replaced, enter 0). 1/		

1/ Model will replace the item or group the number of times required to complete the planning period.

LINE NO.		ANALYSIS 1	ANALYSIS 2
12.	Item or group C Gutter Cleaner & Forage Equipment (If none is to be considered, enter a "0" on line 12 and proceed to line 14.)		
	a. Total dollar cost	12. 00700000	
	b. Year of purchase (0 = beg. of planning period, 1 = end of 1st year, etc.)		
13.	a. Depreciation years	13. 06101106	
	b. Salvage percent		
	c. Depreciation type (see 3c for types)		
	d. Federal ITC (0 = no; 1 = yes)		
	e. State ITC (0 = no; 1 = yes)		
	f. Years to replacement (if not to be replaced, enter 0). 1/		

Section IV. Livestock Investment Information.
(If no livestock is involved, enter "0" on line 14 & line 15 and proceed to line 21.)

14.	a. Number of cows before	14. 061080085	
	b. Average number of cows in year 1		
	c. Average number of cows in year 2		
15.	a. Average number of cows in year 3	15. 090095100	
	b. Average number of cows in year 4		
	c. Average number of cows in year 5		
16.	a. Number of cows purchased in year 0. 2/	16. 010005005	
	b. Number of cows purchased in year 1		
	c. Number of cows purchased in year 2		

2/Animals to be purchased early in any business year should be included with the preceding investment year purchases. Include only animals purchased to increase the herd size. Do not include animals purchased as replacements.

		LINE NO.	ANALYSIS 1	ANALYSIS 2
17. a.	Number of cows purchased in year 3	17.	005 000 200	
b.	Number of cows purchased in year 4			
c.	Cull value per head 3/			
18. a.	Purchase price per head 3/	18.	0500 4020	
b.	Years to replacement			
c.	Percent to be replaced with purchased animals			
19. a.	Depreciation years	19.	3 1 1 1 0 1 1 1	
b.	Depreciation type (see 3c for types)			
c.	Salvage value per head for tax depreciation purposes			
d.	Federal ITC (0=no; 1=yes)			
e.	State ITC (0=no; 1=yes)			
20. a.	Value per cow at end of planning period. 3/	20.	500 250 017	
b.	Average value per heifer at end of planning period. 3/			
c.	Increase in number of heifers by end of planning period			

Section V. Land Investment Information.

(Enter all depreciable real estate under Section II. If no land purchase is involved, enter 0 on line 21 and proceed to line 27.)

21.	Item or group A			
a.	Year of purchase	21.	0	
b.	Cost			
22.	Terminal value at end of planning period	22.		
23.	Item or group B			
a.	Year of purchase	23.		
b.	Cost			

3/ Enter value in year 0 dollars. If cow values are being inflated, an actual dollar value will be calculated by inflating the value entered.

	LINE NO.	ANALYSIS 1	ANALYSIS 2
24. Terminal value at end of planning period	24.		
25. Item or group C_____			
a. Year of purchase	25.		
b. Cost_____			
26. Terminal value at end of planning period	26.		

Section VI. Income Tax and Cost of Capital Information.

27. a. Cost of Capital (%)	27.	11	
b. Federal Income tax bracket assuming the proposed investment is not made. _____		22	
c. Taxable Business Income ($1000) for unincorporated business tax (without investment). _____		08	
d. State code (New York = 31) _____		31	
e. Number of tax families _____		4	

Section VII. Projected Increase in Cash Flow.
(If cash flow is to be estimated by the program, enter "0" on line 28 and proceed to line 33). Enter increase in cash flow before income taxes. (Projected increase in cash receipts minus increase in cash expenses). 4/

28. a. Years 5/	28.	10	
b. Amount _____			
29. a. Years	29.		
b. Amount _____			
30. a. Years	30.		
b. Amount _____			
31. a. Years	31.		
b. Amount _____			
32. a. Years	32.		
b. Amount _____			

4/ Do not include increased sales of calves and cull cows nor added purchased replacements.

5/ Total of years in 28 thru 32 must equal planning period in line 1.

	LINE NO.	ANALYSIS 1	ANALYSIS 2
Section VIII Budget Projection Data. (If cash flows are entered on lines 28 through 32, go to line 59).			
CASH INCOME AND EXPENSE DATA FOR BASE YEAR 6/			
33. Labor	33.	007000	
34. Feed	34.	013600	
Machinery			
35. a. Machine hire	35.	0200 01400	
b. Machinery repairs			
36. a. Auto Expense (farm share)	36.	0400 01500	
b. Gas and oil			
Livestock			
37. a. Purchased replacements 7/	37.	00900 0800	
b. Breeding fees			
38. a. Veterinary & Medicine	38.	0500 01600	
b. Other livestock expense			
Crops			
39. Lime and Fertilizer	39.	001200	
40. a. Seeds and plants	40.	0800 00100	
b. Spray, other crop expense			
Real Estate			
41. a. Land, buildings & fence repair	41.	0900 01100	
b. Taxes			
42. a. Insurance	42.	0850 0	
b. Rent			

6/ Adjust base year record where more or less than one year's expense is included i.e., if the feed bill was paid off, include only those feed costs incurred during the year. The data entered for the base year should reflect the results of future operation of the business if the investment is not made.

7/ Include only replacements for the presently owned herd. Exclude animals purchased to increase herd size.

	LINE NO.	ANALYSIS 1	ANALYSIS 2
Other			
43. a. Telephone & Electricity	43.	085 00 200	
b. Miscellaneous			
Total Expenses			
INCOME			
44. Milk sales	44.	059 00	
45. Livestock sales	45.	006 000	
46. a. Crop sales	46.	014 00 800	
b. Miscellaneous			
Total Income			
Total Expenses			
Net Cash Flow			
OTHER INFORMATION			
47. a. Hired labor costs in 5th year	47.	007 000	014 000
48. a. Acres of corn - base year	48.	036 080 080	
b. Acres of corn - Year 1			
c. Acres of corn - Year 2			
49. a. Acres of corn - Year 3	49.	080 080 080	
b. Acres of corn - Year 4			
c. Acres of corn - Year 5 and after			
50. a. Acres of hay crops - base year (include cropland pasture)	50.	093 080 080	
b. Acres of hay crops - Year 1			
c. Acres of hay crops - Year 2			
51. a. Acres of hay crops - Year 3	51.	080 080 080	
b. Acres of hay crops - Year 4			
c. Acres of hay crops - Year 5 and after			

		LINE NO.	ANALYSIS 1	ANALYSIS 2
52. a.	Acres of other feed crops - base year	52.	011000000	
b.	Acres of other feed crops - Year 1			
c.	Acres of other feed crops - Year 2			
53. a.	Acres of other feed crops - Year 3	53.	000000000	
b.	Acres of other feed crops - Year 4			
c.	Acres of other feed crops - Year 5 and after			
54. a.	Acres of non-feed crops - base year	54.	0	
b.	Acres of non-feed crops - Year 1			
c.	Acres of non-feed crops - Year 2			
55. a.	Acres of non-feed crops - Year 3	55.	0	
b.	Acres of non-feed crops - Year 4			
c.	Acres of non-feed crops - Year 5			
56. a.	Percent of crop sales from non-feed crops - base year	56.	000069000	
b.	Market value of real estate before investment			
57. a.	Pounds of milk per cow base year	57.	11900064	
b.	Average number of cows in base year			
58. a.	Added crop acres rented	58.	020115	
b.	Year rent to start (1-5)			
c.	Rental rate per acre			

Section IX. Modification of Assumptions 8/

(Enter "0" on line following last modification to be made. If none, enter "0" on line 59)

59. a.	Assumption value desired	59.	000050.956	
b.	Assumption code			

8/See user's manual for assumptions and how to use this section.

			LINE NO.	ANALYSIS 1	ANALYSIS 2
60.	a.	Assumption value desired	60.	000040.057	
	b.	Assumption code			
61.	a.	Assumption value desired	61.	0	
	b.	Assumption code			
62.	a.	Assumption value desired	62.		
	b.	Assumption code			
63.	a.	Assumption value desired	63.		
	b.	Assumption code			
64.	a.	Assumption value desired	64.		
	b.	Assumption code			
65.	a.	Assumption value desired	65.		
	b.	Assumption code			
66.	a.	Assumption value desired	66.		
	b.	Assumption code			
67.	a.	Assumption value desired	67.		
	b.	Assumption code			
68.	a.	Assumption value desired	68.		
	b.	Assumption code			
69.	a.	Input line numbers changed for analysis 2	69.	47	

Printing Terminal Results

Kase, results

ACCESS PROGRAM 50
COMPUTERIZED PLANNING FOR DAIRY FARMS
USING FORM 1 OF PROGRAM 50
INVESTMENT ANALYZED FOR KENNETH KASE
INVESTMENT IS EXPANSION OF DAIRY HERD BY 40 COWS
THIS IS ANALYSIS 1

LINE#	VALUES:					
1	15					
BUILDING INVESTMENT						
2	42000.	0.				
3	15.	0.	1.	0.	1.	0.
4	15000.	0.				
5	15.	0.	1.	1.	1.	0.
6	2000.	4.				
7	0.	0.	9.	0.	0.	0.
EQUIPMENT INVESTMENT						
8	3500.	0.				
9	8.	10.	3.	1.	1.	8.
10	3500.	0.				
11	10.	10.	1.	1.	1.	10.
12	7000.	0.				
13	6.	10.	1.	1.	1.	6.
LIVESTOCK INVESTMENT						
14	61.	80.	85.			
15	90.	95.	100.			
16	10.	5.	5.			
17	5.	0.	200.			
18	500.	4.	20.			
19	3.	1.	110.	1.	1.	
20	500.	250.	17.			
LAND INVESTMENT						
INCOME TAX, COST OF CAPITAL						
27	11.	22.	8.	31.	1.	

INCOME, EXPENSE - BASE YEAR

33	7000.	
34	13600.	
35	200.	1400.
36	400.	1500.
37	900.	800.
38	500.	1600.
39	1200.	
40	800.	100.
41	900.	1100.
42	850.	0.
43	850.	200.
44	59900.	
45	6000.	
46	1400.	800.

OTHER INFO

47	7000.		
48	36.	80.	80.
49	80.	80.	80.
50	93.	80.	80.
51	80.	80.	80.
52	11.	0.	0.
53	0.	0.	0.
54	0.	0.	0.
55	0.	0.	0.
56	0.		69000.
57	11900.	61.	
58	20.	1.	15.

MOD ASSUMPTIONS

59	50.0	56.
60	40.0	57.

Kase, results, cont.

1. NET PRESENT VALUE OF INVESTMENT ($) IS: 37388.

2. PERCENT AFTER TAX COST OF CAPITAL IS: 7.7

3. CASH FLOW

YEAR	BEFORE TAX CASH FLOW	DEPRE-CIATION	TAXABLE INCOME	TAX	AFTER TAX CASH FLOW	PRESENT VALUE
1	11974.	7410.	3754.	1388.	10586.	9830.
2	14255.	7581.	5944.	2247.	12008.	10352.
3	16568.	7772.	8121.	3137.	13432.	10752.
4	18618.	7519.	10758.	4085.	14533.	10802.
5	20599.	6907.	13432.	5118.	15481.	10683.
6	20599.	6413.	14126.	5418.	15181.	9727.
7	20599.	6101.	14448.	5655.	14943.	8891.
8	20599.	6062.	14506.	5593.	15006.	8290.
9	20599.	6820.	13759.	5296.	15302.	7849.
10	20599.	6601.	13977.	5350.	15248.	7262.
11	20599.	6437.	14141.	5470.	15129.	6690.
12	20599.	6314.	14264.	5482.	15117.	6207.
13	20599.	6222.	14357.	5614.	14985.	5713.
14	20599.	6153.	14426.	5556.	15043.	5325.
15	20599.	6101.	14478.	5580.	15019.	4936.
TOTAL						123309.

4. INVESTMENTS (OUTLAY)

YEAR	BUILDINGS	EQUIPMENT	CATTLE PURCHASED	CATTLE RAISED	LAND	TOTAL	PRESENT VALUE
0	57000.	14000.	5500.	4500.	0.	81000.	81000.
1	0.	0.	2500.	225.	0.	2725.	2530.
2	0.	0.	2500.	225.	0.	2725.	2349.
3	0.	0.	2750.	0.	0.	2750.	2201.
4	2000.	0.	0.	2475.	0.	4475.	3326.
6	0.	6300.	0.	0.	0.	6300.	4037.
8	0.	3150.	0.	0.	0.	3150.	1740.
10	0.	3150.	0.	0.	0.	3150.	1500.
12	0.	6300.	0.	0.	0.	6300.	2587.
TOTAL							101271.
TERMINAL VALUE BEFORE TAX	0.	6242.	23750.		0.	29992.	9858.
AFTER TAX	0.	6242.	20037.		0.	26279.	8637.

5. INVESTMENT TAX CREDIT

YEAR	AMOUNT
1	5710.
2	83.
3	83.
4	102.
7	747.
9	490.
11	490.
13	747.

PRESENT VALUE OF INVESTMENT TAX CREDIT IS: 6713.

6. BUDGET

ITEM	YEAR 1	2	3	4	5
LABOR	7000.	7000.	7000.	7000.	7000.
FEED	15659.	18238.	20066.	21795.	24374.
MACHINE HIRE	340.	340.	340.	340.	340.
MACHINE REPAIRS	1875.	2000.	2125.	2250.	2375.
AUTO EXPENSE	525.	557.	590.	623.	656.
GAS & OIL	2009.	2143.	2277.	2411.	2545.
PURCHASED REPLACEMENTS	1400.	1400.	1400.	1900.	1900.
BREEDING FEES	1049.	1115.	1180.	1246.	1311.
VET & MEDICINE	656.	697.	738.	779.	820.
OTHER LIVESTOCK	2098.	2230.	2361.	2492.	2623.
LIME & FERT	1853.	1853.	1853.	1853.	1853.
SEEDS & PLANTS	1027.	1027.	1027.	1027.	1027.
SPRAY & OTHER CROP	141.	141.	141.	141.	141.
LAND, BUILD, REPAIRS	1272.	1272.	1272.	1272.	1285.
TAXES	1554.	1554.	1554.	1554.	1570.
INSURANCE	1201.	1201.	1201.	1201.	1213.
RENT	300.	300.	300.	300.	300.
TELEPHONE & ELECTRICITY	1115.	1184.	1254.	1324.	1393.
MISC. EXPENSES	244.	263.	277.	294.	313.
TOTAL EXPENSES	41318.	44514.	46956.	49801.	53039.
MILK SALES	77682.	82847.	88049.	93287.	98197.
LIVESTOCK SALES	7182.	7430.	7678.	8126.	8374.
CROP SALES - FEED	1600.	1600.	849.	0.	0.
CROP SALES - NON-FEED	0.	0.	0.	0.	0.
MISC. INCOME	1028.	1092.	1148.	1206.	1267.
TOTAL	87492.	92969.	97724.	102619.	107838.
NET INCOME	46174.	48455.	50768.	52818.	54799.
INCREASE IN CASH FLOW	11974.	14255.	16568.	18618.	20599.

INVESTMENT TAX CREDIT EXCEEDS TAX TO BE PAID IN YEARS:
1

THIS IS ANALYSIS 2

Kase, results, cont.

DATA CHANGES

47 14000.
END OF CHANGES

1. NET PRESENT VALUE OF INVESTMENT ($) IS: -32.

2. PERCENT AFTER TAX COST OF CAPITAL IS: 8.7

3. CASH FLOW

YEAR	BEFORE TAX CASH FLOW	DEPRE-CIATION	TAXABLE INCOME	TAX	AFTER TAX CASH FLOW	PRESENT VALUE
1	8544.	7410.	324.	114.	8429.	7755.
2	9922.	7581.	1610.	571.	9351.	7914.
3	11332.	7772.	2885.	1054.	10278.	8003.
4	12479.	7519.	4620.	1725.	10753.	7702.
5	13557.	6907.	6390.	2438.	11119.	7327.
6	13557.	6413.	7084.	2573.	10984.	6658.
7	13557.	6101.	7406.	2724.	10833.	6041.
8	13557.	6062.	7465.	2632.	10925.	5605.
9	13557.	6820.	6717.	2359.	11199.	5286.
10	13557.	6601.	6936.	2403.	11154.	4843.
11	13557.	6437.	7100.	2506.	11051.	4415.
12	13557.	6314.	7223.	2515.	11042.	4058.
13	13557.	6222.	7315.	2629.	10928.	3695.
14	13557.	6153.	7384.	2578.	10979.	3415.
15	13557.	6101.	7436.	2598.	10959.	3136.
TOTAL						85852.

4. INVESTMENTS (OUTLAY)

YEAR	BUILDINGS	EQUIPMENT	CATTLE PURCHASED	CATTLE RAISED	LAND	TOTAL	PRESENT VALUE
0	57000.	14000.	5500.	4500.	0.	81000.	81000.
1	0.	0.	2500.	225.	0.	2725.	2507.
2	0.	0.	2500.	225.	0.	2725.	2306.
3	0.	0.	2750.	0.	0.	2750.	2141.
4	2000.	0.	0.	2475.	0.	4475.	3205.
6	0.	6300.	0.	0.	0.	6300.	3819.
8	0.	3150.	0.	0.	0.	3150.	1616.
10	0.	3150.	0.	0.	0.	3150.	1368.
12	0.	6300.	0.	0.	0.	6300.	2315.
TOTAL							100278.
TERMINAL VALUE BEFORE TAX	0.	6242.	23750.		0.	29992.	8582.
AFTER TAX	0.	6242.	21148.		0.	27390.	7837.

5. INVESTMENT TAX CREDIT

YEAR	AMOUNT
1	5710.
2	83.
3	83.
4	102.
7	747.
9	490.
11	490.
13	747.

PRESENT VALUE OF INVESTMENT TAX CREDIT IS: 6557.

6. BUDGET

ITEM	YEAR 1	2	3	4	5
LABOR	10410.	11308.	12205.	13103.	14000.
FEED	15659.	18238.	20066.	21795.	24374.
MACHINE HIRE	340.	340.	340.	340.	340.
MACHINE REPAIRS	1875.	2000.	2125.	2250.	2375.
AUTO EXPENSE	525.	557.	590.	623.	656.
GAS & OIL	2009.	2143.	2277.	2411.	2545.
PURCHASED REPLACEMENTS	1400.	1400.	1400.	1900.	1900.
BREEDING FEES	1049.	1115.	1180.	1246.	1311.
VET & MEDICINE	656.	697.	738.	779.	820.
OTHER LIVESTOCK	2098.	2230.	2361.	2492.	2623.
LIME & FERT	1853.	1853.	1853.	1853.	1853.
SEEDS & PLANTS	1027.	1027.	1027.	1027.	1027.
SPRAY & OTHER CROP	141.	141.	141.	141.	141.
LAND, BUILD, REPAIRS	1272.	1272.	1272.	1272.	1285.
TAXES	1554.	1554.	1554.	1554.	1570.
INSURANCE	1201.	1201.	1201.	1201.	1213.
RENT	300.	300.	300.	300.	300.
TELEPHONE & ELECTRICITY	1115.	1184.	1254.	1324.	1393.
MISC. EXPENSES	264.	288.	308.	330.	354.
TOTAL EXPENSES	44748.	48848.	52192.	55940.	60081.
MILK SALES	77682.	82847.	88049.	93287.	98197.
LIVESTOCK SALES	7182.	7430.	7678.	8126.	8374.
CROP SALES - FEED	1600.	1600.	849.	0.	0.
CROP SALES - NON-FEED	0.	0.	0.	0.	0.
MISC. INCOME	1028.	1092.	1148.	1206.	1267.
TOTAL	87492.	92969.	97724.	102619.	107838.
NET INCOME	42744.	44122.	45532.	46679.	47757.
INCREASE IN CASH FLOW	8544.	9922.	11332.	12479.	13557.

INVESTMENT TAX CREDIT EXCEEDS TAX TO BE PAID IN YEARS:
1

NO MORE ANALYSES - RUN ENDED

ACCESS PROGRAM 50 - COMPUTERIZED PLANNING FOR DAIRY FARMS
SHORT INPUT FORM

PROGRAM 05001 PHONE _____ DATE _____

NAME KENNETH KASE (24 characters maximum) ADDRESS _____

INVESTMENT EXPANSION OF DAIRY HERD BY 40 COWS (40 characters maximum) _____

INPUT LINE	ANALYSIS 1	ANALYSIS 2	ANALYSIS 3	ANALYSIS 4
01	15			
02	04200000			
03	15004700			
04	01500000			
05	15001100			
06	02200004			
07	00000000			
08	00350000			
09	01013101			
10	00350000			
11	10101110			
12	00700000			
13	06101106			
14	06102025			
15	00000570			
16	07000505			
17	00500020			
18	00004020			
19	31110111			
20	50025017			

INPUT LINE	ANALYSIS 1	ANALYSIS 2	ANALYSIS 3	ANALYSIS 4
21	0			
22				
23				
24				
25				
26				
27	11 22 08 31 1			
28	0			
29				
30				
31				
32				
33	00 70 00			
34	01 36 00			
35	02 00 01 40 00			
36	04 00 01 50 00			
37	00 90 01 00 00			
38	05 00 01 60 00			
39	00 78 00			
40	08 00 00 01 00			
41	09 00 01 10 00			
42	08 50 0			
43	08 50 00 20 00			
44	05 99 00			
45	00 60 00 0			
46	01 40 01 00 0			

INPUT LINE	ANALYSIS 1	ANALYSIS 2	ANALYSIS 3	ANALYSIS 4
47	0 0 7 0 0 0	0 1 4 0 0 0		
48	0 3 6 0 8 0 0 8 0			
49	0 8 0 0 8 0 0 8 0			
50	0 9 3 0 8 0 0 8 0			
51	0 8 0 0 8 0 0 8 0			
52	0 1 1 0 0 0 0 0 0			
53	0			
54	0			
55	0			
56	0 0 0 0 6 9 0 0 0			
57	1 1 9 0 0 9 6 1			
58	0 3 0 1 1 5			
59	0 0 0 0 5 0 . 0 5 6			
60	0 0 0 0 4 0 . 0 5 7			
61	0			
62				
63				
64				
65				
66				
67				
68				
69	4 7			

RESULTS - COMPUTERIZED PLANNING FOR DAIRY FARMS

OUTPUT	Result No.	Analysis 1	Analysis 2	Analysis 3
Net present value of investment ($)	01.	37,388	-32	
After tax cost of capital (%)	02.	7.7	8.7	
After tax cash flow: year 1	03.	10,586	8,429	
year 2	04.	12,008	9,351	
year 3	05.	13,432	10,278	
year 4	06.	14,533	10,753	
year 5	07.	15,481	11,119	
year 6	08.	15,181	10,984	
year 7	09.	14,943	10,833	
year 8	10.	15,006	10,925	
year 9	11.	15,302	11,199	
year 10	12.	15,248	11,154	
Present value of after tax cash flows	13.	123,309	85,852	
Year in which investment is made AND amount of total investment (first ten years of investments)	14.	0 & 81,000	0 & 81,000	&
	15.	1 & 2,725	1 & 2,725	&
	16.	2 & 2,725	2 & 2,725	&
	17.	3 & 2,750	3 & 2,750	&
	18.	4 & 4,475	4 & 4,475	&
	19.	6 & 6,300	6 & 6,300	&
	20.	8 & 3,150	8 & 3,150	&
	21.	10 & 3,150	10 & 3,150	&
	22.	12 & 6,300	12 & 6,300	&
	23.	&	&	&
Present value of investments	24.	101,271	100,278	

		Result No.	Analysis 1	Analysis 2	Analysis 3
Before Tax Terminal Values of	Buildings	25.	0	0	
	Equipment	26.	6,242	6,242	
	Cattle	27.	23,750	23,750	
	Land	28.	0	0	
Present value of after tax terminal value of all investments		29.	8,637	7,837	
Year in which investment tax credit is received AND amount of investment tax credit (first five years with investment tax credit)		30.	1 & 5,710	1 & 5,710	&
		31.	2 & 83	2 & 83	&
		32.	3 & 83	3 & 83	&
		33.	4 & 102	4 & 102	&
		34.	7 & 747	7 & 747	&
Total investment tax credit(s)		35.	8,452	8,452	
Present value of investment tax credit		36.	6,713	6,557	
Budget Values					
Labor		37.	7,000	10,410	
Feed		38.	15,659	15,659	
Machine hire		39.	340	340	
Machine repairs		40.	1,875	1,875	
Auto expense		41.	525	525	
Gas and oil		42.	2,009	2,009	
Purchased replacements		43.	1,400	1,400	
Breeding fees		44.	1,049	1,049	
Vet and medicine		45.	656	656	
Other livestock		46.	2,098	2,098	
Lime and fertilizer		47.	1,853	1,853	
Seeds and plants		48.	1,027	1,027	

	Result No.	Analysis 1	Analysis 2	Analysis 3
Spray and other crop	49.	141	141	
Land, build., repairs	50.	1,272	1,272	
Taxes	51.	1,554	1,554	
Insurance	52.	1,201	1,201	
Rent	53.	300	300	
Telephone and electricity	54.	1,115	1,115	
Miscellaneous expenses	55.	244	244	
Total expenses	56.	41,318	41,318	
Milk sales	57.	77,682	77,682	
Livestock sales	58.	7,182	7,182	
Crop sales - feed	59.	1,600	1,600	
Crop sales - Non-feed	60.	0	0	
Miscellaneous income	61.	1,028	1,028	
Total income	62.	87,492	87,492	
Net income	63.	46,174	42,744	
Increase in cash flow	64.	11,974	8,544	
Number of years investment tax credit exceeds tax to be paid AND number of years losses are incurred and not carried forward or backward AND number of years special 20% first year depreciation exceeds maximum	65.	1&0&0	1&0&0	& &

Analysis with Only Federal Taxes

On the preceding pages, the Kase farm dairy herd expansion was analyzed using both federal and state income taxes. An analysis of the same investment using only federal taxes is presented below. The only changes in input occur on line 27 which is reproduced below.

Section VI. Income Tax and Cost of Capital Information.

27. a. Cost of Capital (%) 27. 11|22|00|53|1|

b. Federal Income tax bracket assuming the proposed investment is not made. _____

c. Taxable Business Income ($1000) for unincorporated business tax (without investment). _____

d. State code _____

e. Number of tax families _____

Zeros are entered on line 27c because the unincorporated business tax is not considered. The state code for a non-existent state is entered on line 27d. This insures that no state income taxes are calculated.

For states with no state income tax, investment proposals can correctly be analyzed using only federal taxes by following the above procedure.

For states with state income taxes but for which no state tax subroutine is available, an approximate investment analysis can be made by considering only federal taxes in the analysis. The net present value can then be adjusted, implicitly or explicitly, by using state tax information for the state in which the business is located. If the user is unsure whether a state tax subroutine is available, the user's state code should be entered. If no state tax subroutine is available the computer will automatically calculate only federal taxes.

Printing Terminal Results

Only line 27 of the input data is shown as it would appear on the printout. The remainder of the printout of the input data is the same as shown on pages 45 and 46.

The present value analysis is shown on the following two pages.

ACCESS PROGRAM 50
COMPUTERIZED PLANNING FOR DAIRY FARMS
USING FORM 1 OF PROGRAM 50

Kase, only
Federal Taxes

INVESTMENT ANALYZED FOR KENNETH KASE
INVESTMENT IS EXPANSION OF DAIRY HERD BY 40 COWS
THIS IS ANALYSIS 1

INCOME TAX, COST OF CAPITAL
27 11. 22. 0. 53. 1.

1. NET PRESENT VALUE OF INVESTMENT ($) IS: 38221.

2. PERCENT AFTER TAX COST OF CAPITAL IS: 8.6

3. CASH FLOW

YEAR	BEFORE TAX CASH FLOW	DEPRE-CIATION	TAXABLE INCOME	TAX	AFTER TAX CASH FLOW	PRESENT VALUE
1	11974.	7410.	3754.	879.	11096.	10217.
2	14255.	7581.	5944.	1426.	12829.	10878.
3	16568.	7772.	8121.	2034.	14534.	11348.
4	18618.	7519.	10758.	2803.	15815.	11370.
5	20599.	6907.	13432.	3658.	16940.	11214.
6	20599.	6413.	14126.	3885.	16713.	10188.
7	20599.	6101.	14448.	4001.	16597.	9316.
8	20599.	6062.	14506.	4022.	16576.	8567.
9	20599.	6820.	13759.	3763.	16836.	8013.
10	20599.	6601.	13977.	3833.	16766.	7347.
11	20599.	6437.	14141.	3891.	16708.	6742.
12	20599.	6314.	14264.	3935.	16663.	6192.
13	20599.	6222.	14357.	3968.	16630.	5690.
14	20599.	6153.	14426.	3993.	16605.	5232.
15	20599.	6101.	14478.	4012.	16587.	4812.
TOTAL						127124.

4. INVESTMENTS (OUTLAY)

YEAR	BUILDINGS	EQUIPMENT	CATTLE PURCHASED	CATTLE RAISED	LAND	TOTAL	PRESENT VALUE
0	57000.	14000.	5500.	4500.	0.	81000.	81000.
1	0.	0.	2500.	225.	0.	2725.	2509.
2	0.	0.	2500.	225.	0.	2725.	2311.
3	0.	0.	2750.	0.	0.	2750.	2147.
4	2000.	0.	0.	2475.	0.	4475.	3217.
6	0.	6300.	0.	0.	0.	6300.	3840.
8	0.	3150.	0.	0.	0.	3150.	1628.
10	0.	3150.	0.	0.	0.	3150.	1380.
12	0.	6300.	0.	0.	0.	6300.	2341.
TOTAL							100373.
TERMINAL VALUE BEFORE TAX	0.	6242.	23750.		0.	29992.	8701.
AFTER TAX	0.	6242.	21038.		0.	27280.	7914.

Kase, only
Federal Taxes, cont.

5. INVESTMENT TAX CREDIT

YEAR	AMOUNT
1	2850.
2	83.
3	83.
4	92.
7	467.
9	350.
11	350.
13	467.

PRESENT VALUE OF INVESTMENT TAX CREDIT IS: 3555.

6. BUDGET

ITEM	YEAR 1	2	3	4	5
LABOR	7000.	7000.	7000.	7000.	7000.
FEED	15659.	18238.	20066.	21795.	24374.
MACHINE HIRE	340.	340.	340.	340.	340.
MACHINE REPAIRS	1875.	2000.	2125.	2250.	2375.
AUTO EXPENSE	525.	557.	590.	623.	656.
GAS & OIL	2009.	2143.	2277.	2411.	2545.
PURCHASED REPLACEMENTS	1400.	1400.	1400.	1900.	1900.
BREEDING FEES	1049.	1115.	1180.	1246.	1311.
VET & MEDICINE	656.	697.	738.	779.	820.
OTHER LIVESTOCK	2098.	2230.	2361.	2492.	2623.
LIME & FERT	1853.	1853.	1853.	1853.	1853.
SEEDS & PLANTS	1027.	1027.	1027.	1027.	1027.
SPRAY & OTHER CROP	141.	141.	141.	141.	141.
LAND, BUILD, REPAIRS	1272.	1272.	1272.	1272.	1285.
TAXES	1554.	1554.	1554.	1554.	1570.
INSURANCE	1201.	1201.	1201.	1201.	1213.
RENT	300.	300.	300.	300.	300.
TELEPHONE & ELECTRICITY	1115.	1184.	1254.	1324.	1393.
MISC. EXPENSES	244.	263.	277.	294.	313.
TOTAL EXPENSES	41318.	44514.	46956.	49801.	53039.
MILK SALES	77682.	82847.	88049.	93287.	98197.
LIVESTOCK SALES	7182.	7430.	7678.	8126.	8374.
CROP SALES - FEED	1600.	1600.	849.	0.	0.
CROP SALES - NON-FEED	0.	0.	0.	0.	0.
MISC. INCOME	1028.	1092.	1148.	1206.	1267.
TOTAL	87492.	92969.	97724.	102619.	107838.
NET INCOME	46174.	48455.	50768.	52818.	54799.
INCREASE IN CASH FLOW	11974.	14255.	16568.	18618.	20599.

NO MORE ANALYSES - RUN ENDED